



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/782,339	02/13/2001	Masahiko Hirose	04558/048001	7852

22511 7590 01/30/2004

ROSENTHAL & OSHA L.L.P.  
1221 MCKINNEY AVENUE  
SUITE 2800  
HOUSTON, TX 77010

EXAMINER

MENON, KRISHNAN S

ART UNIT PAPER NUMBER

1723

DATE MAILED: 01/30/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/782,339

Applicant(s)

HIROSE ET AL.

Examiner

Krishnan S Menon

Art Unit

1723

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 12 December 2003.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-19 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. §§ 119 and 120

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.  
a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

Art Unit: 1723

### DETAILED ACTION

Claims 1-19 are pending.

#### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

1. Claims 1,2,4,5 and 11-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP 11-010146 in view of Uemura et al (US 4,761,234).

JP 146 teaches plurality of composite reverse osmosis membrane modules in multistages (figures and specification) with at least one final and one prefinal stage, modules having porous support and polyamide skin layer, selected portion of permeate from prefinal stage supplied to the final stage and rest mixed with the permeate of the final stage as in instant claims 1 and 2; permeated water supplied to the final stage is adjusted to be alkaline at pH about 8 as in instant claims 4 and 5; The salt rejection or prefinal stage at least 99.5% with flux at least 0.3 m<sup>3</sup>/m<sup>2</sup> day, when operating at 3.5% salt, pH 6.5 and 5.5 MPA at 25C, as in instant claims 11 and 12; The final stage module has at least 99% salt rejection, 0.7 m<sup>3</sup>/m<sup>2</sup>/day flux for 0.05% salt water at pH 6.5, 25C and 0.75 MPA as in instant claims 15 and 16.

Re the limitation of claim 1, the polyamide skin layer of the at least one pre-final module comprising bromine atoms, JP 146 does not teach. Uemura teaches a

Art Unit: 1723

membrane comprising bromine atoms in the polyamide discriminating layer (col 3 line 62 – col 4 line 5, col 11 lines 19-35, col 13 lines 8-23). It would be obvious to one of ordinary skill in the art at the time of invention to use the teaching of Uemura in the teaching of JP 146 for a module for high salt rejection and stable water flux as taught by Uemura (see abstract and col 2 line 67 – col 3 line 25).

Re claims 13 and 14, JP-146 in view of Uemura does not specifically teach the rejection of boron. However, since the membrane of JP-146 in view of Uemura is similar to the membrane used by the applicant, similar rejections are expected [inherent property - Where applicant claims a composition in terms of a function, property or characteristic and the composition of the prior art is the same as that of the claim but the function is not explicitly disclosed by the reference, the examiner may make a rejection under both 35 U.S.C. 102 and 103, expressed as a 102/103 rejection. "There is nothing inconsistent in concurrent rejections for obviousness under 35 U.S.C. 103 and for anticipation under 35 U.S.C. 102." In re Best, 562 F.2d 1252, 1255 n.4, 195 USPQ 430, 433 n.4 (CCPA 1977). This same rationale should also apply to product, apparatus, and process claims claimed in terms of function, property or characteristic. Therefore, a 35 U.S.C. 102/103 rejection is appropriate for these types of claims as well as for composition claims.]

2. Claims 3, 6-10 and 17-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP 146 in view of Uemura as in claim 1 above and further in view of Bray (US 4,046,685).

Art Unit: 1723

JP 146 in view of Uemura teaches all the limitations of the instant claims as in claim 1, and the quality of the feed water as in instant claims 17 and 18, but does not teach splitting the permeate stream from the pre-final stage to two and feeding only one of them to the final stage. Bray (685) teaches (Fig 1,2 and col 5: 4-35) the splitting of the permeate stream to two separate streams, taking first permeate stream, having a lower salt content, from the feed (upstream) end and the second permeate stream having a higher salt content from the retentate end. Bray (685) has a string of modules in a housing, connected in series by the permeate tube, with the feed from one end of the housing and the permeate from the other end. His means for splitting the permeate stream is blocking the through passage in the permeate tube link at a convenient location inside the housing so that the two permeate streams have a substantially different salt content. The ratio of the salt content in Bray's teachings is 2:1 (Fig 2).

It would be obvious to one of ordinary skill in the art at the time of invention to use the Bray (685) teachings in the teaching of JP-146 in view of Uemura to split the permeate flow from a pressure vessel having a string of modules and then feed only that part of the split flow which has the higher salt concentration to the next/final reverse osmosis membrane stage to "advantageously employ the apparatus for a multistage process for converting sea water to potable water" (see Bray abstract).

Re claim 19, the boron concentration in the permeated water would be  $<1$  ppm, since boron rejection by the membrane used and the system structure are similar to that of the applicant's (inherent property).

Art Unit: 1723

***Response to Arguments***

Applicant's arguments with respect to claims 1-19 have been considered but are moot in view of the new ground(s) of rejection.


***Conclusion***

This action is made non-final because of the new grounds for rejection.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Krishnan S Menon whose telephone number is 571-272-1143. The examiner can normally be reached on 8:00-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wanda L Walker can be reached on 571-272-1151. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Krishnan Menon  
Patent Examiner

  
W. L. WALKER  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 1700